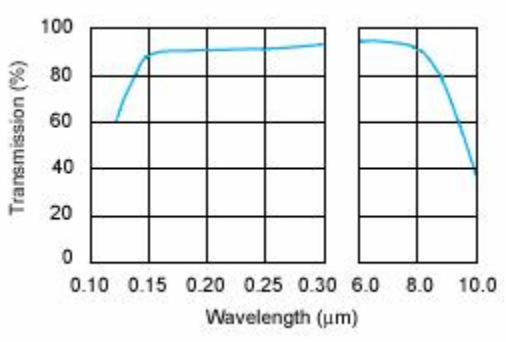
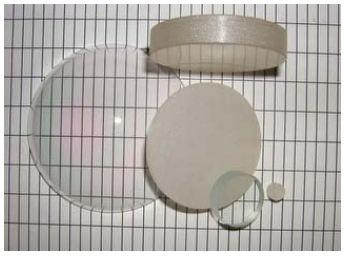
Calcium Fluoride (CaF_2)

OVERVIEW

Calcium Fluoride (CaF_2) has excellent transmission in the ultraviolet range. Often used for windows requiring high transmittance from 150 nm to 9000 nm. Calcium Fluoride can be used in the ultraviolet, visible and infrared spectral regions. Calcium Fluoride has a transmission above 90% between 0.25 µm and 7µm. CaF_2 windows are relatively soft and somewhat hygroscopic so polishing, coating and handling are more critical than UV Fused Silica windows. Polished surfaces are stable and will last several years under normal conditions. Calcium Fluoride is twice as hard as Barium Fluoride and also less susceptible to thermal shock.



PRODUCTS



Phoenix Infrared offers CaF_2 as blanks, generated parts, polished optics, and coated optics. CaF_2 can be found in high power laser optics because of its low absorption. Calcium Fluoride can also be found in cryogenically cooled thermal imaging systems.

We can provide prisms, lenses, wedges, windows and other optical components according to customer specifications and drawings. Optical components up to 180mm in diameter are possible.

SPECIFICATIONS

Chemical Properties	CaF_2
Crystal Class	Cubic, cleaves plane [111]
Density, g/cm^3 (20 °C)	3.18
Molecular Weight	78.08
Dielectric Constant for 105 Hz	6.76
Melting Temperature, K	1630
Thermal Conductivity, W/(m K) at 273 K	10
Thermal Expansion, 1/K at 300 K	18.9 x 10^{-6}
Specific Heat, cal/(g K) at 273 K	0.204
Debye Temperature, K	510
Young's Modulus, GPa	75.79
Shear Modulus, GPa	33.76
Bulk Modulus, GPa	83.03
Poisson's Ratio	0.218
Knoop Hardness, kg/mm^2	178 [100], 160 [110]

Wavelength µm	Refractive Index
0.191	1.51
0.21	1.49
0.25	1.47
0.33	1.45
0.41	1.44
0.88	1.43
2.65	1.42
3.90	1.41
5.00	1.40
6.20	1.38
7.00	1.36
8.22	1.34

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